

CLAIMS

What is claimed is:

1. A communications device comprising:
- 5 a plurality of media access controllers (MACs) communicating with associated input/output ports, said ports receiving bandwidth allocation requests from one or more end units sharing an associated I/O port; and
- 10 a server communicating with said MACs for receiving requests for bandwidth allocation from a plurality of said end units and identifying transmission intervals in response to said requests for bandwidth allocation, wherein said intervals are communicated to said end units.
- 15 2. The system of Claim 1 further comprising algorithm processors accessed by said server to perform bandwidth allocation calculations and identify a bandwidth allocation to said server based on certain factors.
3. The system of Claim 2 wherein said certain factors include a bandwidth allocation history associated with an end unit requesting bandwidth.
- 20 4. The system of Claim 2 wherein said certain factors include class of service.
5. The system of Claim 2 wherein ones of said algorithm processors are dedicated to performing bandwidth allocation calculations for only specific types of traffic flows.

6. The system of Claim 2 wherein one or more of said algorithm processors perform a portion of said bandwidth allocation calculations, and certain other ones of said algorithm processors complete said calculations.
- 5 7. The system of Claim 1 wherein said server identifies said transmission intervals for a plurality of said end units based on a bandwidth allocation history associated with an end unit requesting bandwidth.
- 10 8. The system of Claim 1 wherein said server accesses a file identifying support services to be provided by said communications device for individual ones of said end units and calculates said transmission intervals for a plurality of said end users based on said support services.
- 15 9. The system of Claim 8 wherein said support services comprise a class of service to be supported by said communications device.
10. The system of Claim 8 wherein said support services comprise a data rate to be supported by said communications device.
- 20 11. The system of Claim 8 wherein said support services include a burst size to be supported by said communications device.
- 25 12. The system of Claim 1 further comprising optical fibers coupled to said input/output ports for transmitting optical signals to and from said communications device.

13. The system of Claim 1 wherein said MACs build a message packet for transmission to one or more of said end units, said message packet including said transmission intervals determined by said server for one or more of said end units.

5

14. The system of Claim 13 wherein said message packet comprises:

a message header;

a message map start time field identifying to said end units a start time for transmission intervals conveyed in said message packet ;

10 a last process time field identifying a time at which said server ceased processing bandwidth allocation requests for the message packet; and

one or more identification fields identifying a traffic flow from one or more of said end units and a corresponding offset time from said map start time to identify transmission intervals for respective ones of said end units.

15

15. The system of Claim 1 wherein said communications device is part of a time division multiple access (TDMA) network and wherein said transmission intervals identify transmission times referenced to a master clock time.

20 16. The system of Claim 15 wherein said transmission intervals correspond to an integral number of fixed slot times.

17. The system of Claim 1 wherein said transmission intervals are identified by an offset from an absolute time.

18. The system of Claim 1 wherein said server accesses a bandwidth allocation history file to identify bandwidths previously allocated to various end units, said bandwidth allocation history file being used to determine said transmission intervals
5 for said end units.

19. A method performed by a communications device for allocating bandwidth comprising:

10 receiving packets containing transmission bandwidth requests from a plurality of end units;

parsing said packets from said end units by a plurality media access controllers (MACs), each MAC being associated with one or more end units;

forwarding said bandwidth requests to a first queue;

15 retrieving said bandwidth requests from said first queue by a server being shared by said MACs;

calculating by said server appropriate transmission intervals for said end units in response to said bandwidth requests;

transmitting said transmission intervals to respective ones of said MACs by said server;

20 building a message packet by respective ones of said MACs incorporating a plurality of transmission intervals calculated by said server; and

transmitting by said respective ones of said MACs said message packet to one or more end units for conveying allocated transmission intervals to said end units.

25

20. The method of Claim 19 wherein said calculating comprises said server accessing one or more algorithm processors for performing calculations for determining said transmission intervals.

5 21. The method of Claim 19 further comprising receiving information from said end units conveying support services to be provided by said communications device, said support services being accessed from a memory when determining appropriate transmission intervals for said end units in response to transmission bandwidth requests by said end units.

10 22. The method of Claim 19 wherein said building a message packet comprises said MACs consolidating various transmission intervals, provided by said server, in a message packet, said message packet comprising:

a message header;

15 a message map start time field identifying to said end units a start time for transmission intervals conveyed in said message packet ;

a last process time field identifying a time at which said server ceased processing bandwidth allocation requests for the message packet; and

20 one or more identification fields identifying a traffic flow from one or more of said end units and a corresponding offset time from said map start time to identify transmission intervals for respective ones of said end units.

23. The method of Claim 19 wherein said calculating comprises said server accessing algorithm processors to perform transmission interval calculations for said end
25 units based on certain factors.

24. The method of Claim 23 wherein said algorithm processors perform bandwidth allocations for specific traffic flows.

5 25. The method of Claim 24 wherein said specific traffic flows include voice traffic having certain packet delay and interpacket jitter requirements.

26. The method of Claim 23 wherein said certain factors comprise a class of service.

10 27. The method of Claim 23 wherein said certain factors comprise a maximum data rate to be supported by said communications device.

28. The method of Claim 23 wherein said certain factors comprise a maximum burst size to be supported by said communications device.

15